

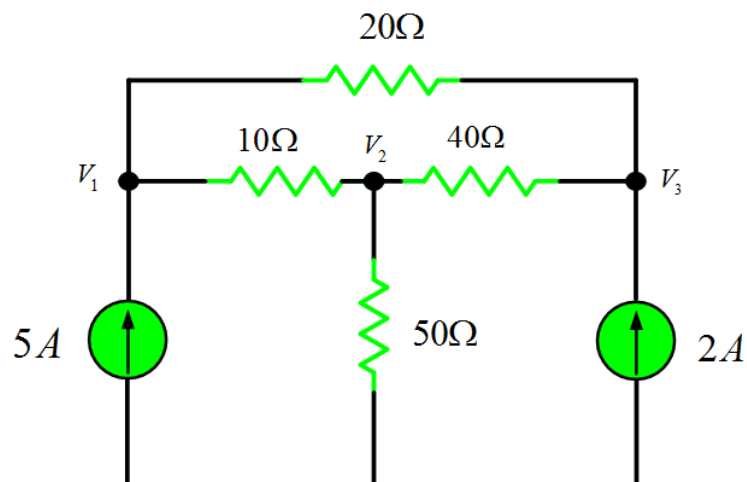
XMUT203 Analogue Circuits and Systems

Laboratory 2: Matlab (Introduction)

Due date: Not for submission

Exercise 1: Nodal Analysis in MATLAB

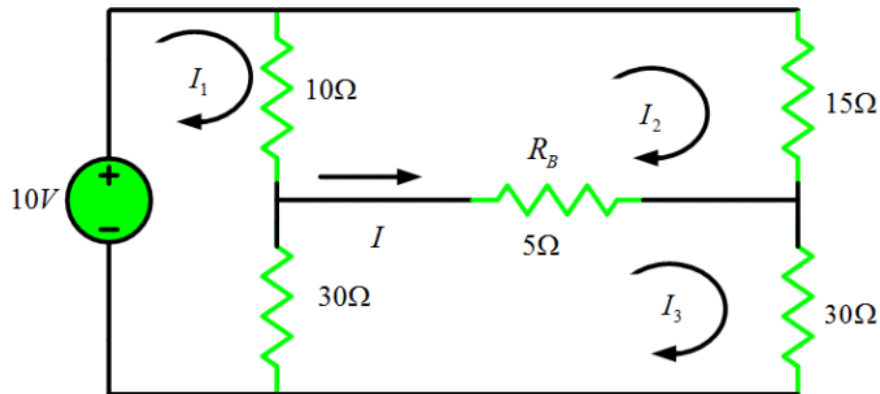
In this first exercise, we will find unknown parameters in a very simple resistive circuit using nodal analysis.



- Calculate the voltages V_1 , V_2 and V_3 . [15 marks]
- Calculate the voltage across and power dissipated in the 40Ω resistor. [10 marks]
- Simulate the circuit in MATLAB using matrix solution method. Determine the voltage across and power dissipated in the 40Ω resistor and voltages V_1 , V_2 , and V_3 . [15 marks]
- Verify whether the calculated values match those from simulation. [10 marks]

Exercise 2: Mesh Analysis in MATLAB

In this second exercise, we will find unknown parameters of the circuit using mesh analysis.



- Calculate the mesh currents I_1 , I_2 , and I_3 . [15 marks]
- Calculate the current I through R_B resistor and power supplied by 10 V voltage source. [10 marks]
- Simulate the circuit in MATLAB using matrix solution method. Determine the current I through R_B resistor, power supplied by 10 V voltage source, and mesh currents I_1 , I_2 , and I_3 . [15 marks]
- Verify whether the calculated values match those from simulation. [10 marks]

NOTE: Attach snapshots of all MATLAB codes and simulation results as the appendix in your report.

Marking Schedule

Student Name : _____

Student ID : _____

No	Description	Mark	Your Mark	Remark
	Exercise 1 – Nodal Analysis			
1a.	Calculated V_1 , V_2 , and V_3 .	15		
1b.	Calculated voltage across and power dissipated in $40\ \Omega$ resistor.	10		
1c.	MATLAB simulation results using nodal analysis with matrix solution method.	15		
1d	Verify the calculate results with simulation.	10		
	Exercise 2 – Mesh Analysis			
2a.	Calculated I_1 , I_2 , and I_3 .	15		
2b.	Calculated current I through R_B resistor and power supplied by the 10 V voltage source.	10		
2c.	MATLAB simulation results using mesh analysis with matrix solution method.	15		
2d	Verify the calculated results with simulation.	10		
	Total	100		

Comment: